White Spots on the European Emission Reduction Roadmap

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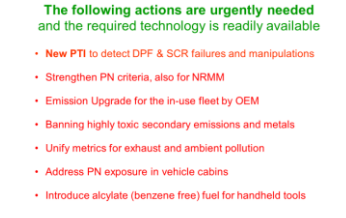
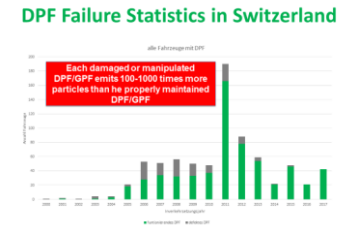
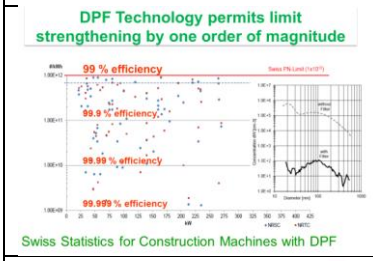
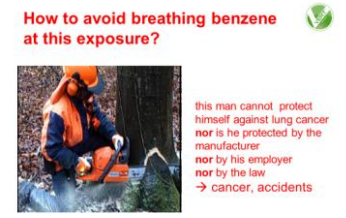
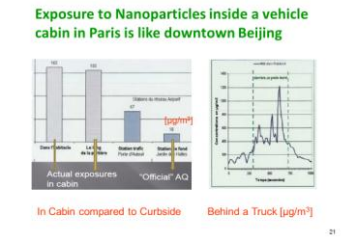
EU-Actions needed to introduce, enforce and preserve BAT = Best Available Technology for Elimination of Toxic Air Contaminants Emitted by Internal Combustion Engines

	The following chapters deal with omitted measures, for which the mitigating effects and practical feasibility is widely known and confirmed by published research Most of them have been discussed in public high level conferences like the annual ETH-Nanoparticle conference in Zürich and also proposed to the commission during public consultancy processes. All of them reflect available and verified technology and could have been considered by the commission in the time-span 2015-2018, which for unknown reasons this has been omitted. **All of them provide high benefit/cost ratios and would, when implemented reduce health cost to an extent which is much higher than the investment.**
	The Commission completely ignored this big risk to release toxicity into the ambient air. She even recommended with Dir. 2014/45 to exclusively use OBD information and resign on emission measurement. Nearly all member states agreed and stopped periodic emission control. During the hearing of the German Parliament in Berlin on Dieselgate in September 2016, VERT recommended NPTI, the periodic technical inspection of emission quality as the only measure to be introduced immediately, within the responsibility of the member state and with a very high success probability to detect systematic failures but also the stochastic failures due to individual manipulations A private task NPTI formed with the Netherlands, Belgium, Germany and others prepared the new procedure and instruments. **Now the New European Commissions must enforce this.**
	Do we have information on Best Available Technology? Yes of course. We are showing here the official Swiss statistics, published by FOEN the Swiss Federal Office for the Environment protection. Plotted are DPF filter efficiencies for all new construction machines imported to Switzerland in the first years after this regulation come into force. The limit value is 10^{12} P/kWh, which requires a DPF with about 99% efficiency. But the diagram clearly shows that many DPF are much better than this, by one, two and even three orders of magnitude. **The Commission could therefore strengthen the PN criterion by one order of magnitude** without creating higher cost of the technology and this would directly influence the ambient exposure level and thereby mortality and global warming. But, please not only for Diesels.
	What about handheld motorized tools in particular chain saws. Although these machines are part of the NRMM-regulation the permissible emission limit of CO is still 800 g/kWh. Unbelievable! Even worse: these machines have usually 2-stroke engines where part of the fuel ends up unburned in the exhaust gas. This fuel – ordinary vehicle petrol – contains a high percentage of Aromates, part of them are PAH, known to be carcinogens like Benzene. Besides cancer these fumes are narcotics and provide a significantly increased accident risk. On the market however, there are Alcylate fuels, standardized by the Swiss norm SN 181'163, which contain no Aromates and no Metals, used in Swedish and Swiss forests. **Why not enforce it by the EU-commission for whole Europe to protect citizens**.
	Here are some results from a quite early Airparif study on vehicle cabin air pollution. They did it at this time by measuring PM particle mass in µg/m3. The histogram on the left shows four situations: two measurements in the vehicle (grey), one inside and one outside: obviously inside equals outside proving that the air intake filter is only filtering very coarse particles, no ultrafines. The two columns on the right show PM2.5 data from official monitoring stations – which you would expect to reflect the pollution in the city. Yes maybe in the city but not in vehicle cabins where pollution is up to 10 times higher. Driving behind a truck (right picture) will increase this in-cabin pollution to much higher values, in this case peaking at 1200 µg/m3 which is the level of an rare emission alarm situation in Beijing. **EU-Commission must establish limit values. Solutions are available, and cost effective.**
	Modern Lubrication oils are very effective to minimize engine wear. But this is mainly due to so-called "oil-packages", which are additives containing many different highly toxic chemical substances and heavy metals like Zink. There are industrial standards to guarantee the performance but no emission regulations at all. Nowhere in the world. As a result ultrafine metal oxide clusters - wear and anti-wear substances - are formed during combustion in the size range of 10-20 nm and emitted – not from Diesel engines only, even more from gasoline, also CNG and even a hydrogen engine would emit this (Miller EST 2007) This emission fraction might be small for a new engine but with aging this part increases to an extent that after years might be higher than the soot fraction (Kansas City Study, Sonntag, EPA, EST 2012). **We have strict standards for fuels. Why not for Lubricants?**

Just no space enough on a poster to list the many problematic areas due to patch-work regulations, missing control, industrial stakeholders lobbying and the absence of a political will to protect humans, nature and climate. Let's hope post Euro 6 will provide new chances.

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